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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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03/22/2004

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EXAMINER

DESAI, ANISH P

ART UNIT

PAPER NUMBER

1771

MAIL DATE

DELIVERY MODE

06/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/806,514	Applicant(s) FROHS ET AL.	
	Examiner Anish Desai	Art Unit 1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-19 is/are pending in the application.
- 4a) Of the above claim(s) 9-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The applicant's arguments in response to the Office action dated 12/27/06 have been fully considered.

1. Claims 1, 2 and 4-18 are pending, claims 9-18 are withdrawn, and claim 3 is cancelled.
2. 112-second paragraph rejections are withdrawn in view of the present amendment and response (page 3 of 03/27/07 amendment).
3. All of the art rejections are maintained.

Claim Rejections - 35 USC § 102/103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 4, and 6-8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mochida et al. (US 5,205,888) substantially as set forth in 12/27/06 Office action.

Regarding claim 1, Mochida teaches a process for making carbon fiber reinforced materials. Additionally, Mochida teaches that carbon fiber reinforced carbon materials are used in many fields including space industry, electronic industry etc. (column 1, lines 14-16). The process of making carbon fiber reinforced materials includes a step of impregnating a carbon fiber assembly with a melt of mesophase pitch or mixing short carbon fibers with the mesophase pitch, shaping the pitch-impregnated assembly or pitch/short carbon fiber mixture, and firing the same (abstract).

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Additionally, the carbon fiber assembly of Mochida is subjected to a preliminary surface treatment such as oxidation (column 3, lines 1-3), which reads on carbon fibers having oxidatively activated surfaces as claimed. The carbon fiber assembly of Mochida reads on claimed connecting piece body. The examiner is interpreting "a connecting piece body" as recited in the preamble of claim 1 as any article comprising carbon fibers will read on "a connecting piece body". According to Mochida, another requirement that should be met by the mesophase pitch for use in the present invention is that it achieves a carbonization yield of at least 80% (column 3, lines 38-43), which reads on coating being carbonized as a carbonization product of a coating material selected from the group consisting wax, **pitch**, natural resins, thermoplastic polymers, and thermosetting polymers as claimed.

Regarding claim 1, Mochida teaches claimed invention except the carbon material electrode connecting piece body having a linear coefficient of thermal expansion of from -0.5 to $+0.1 \mu\text{m}/(\text{K}\cdot\text{m})$ in a direction parallel to a lateral surface thereof, and from 1.7 to $2.1 \mu\text{m}/(\text{K}\cdot\text{m})$ in a normal plane orthogonal thereto, however it is reasonable to presume that the carbon fibers of Mochida have a linear coefficient of thermal expansion of from -0.5 to $+0.1 \mu\text{m}/(\text{K}\cdot\text{m})$ in a direction parallel to a lateral surface thereof, and from 1.7 to $2.1 \mu\text{m}/(\text{K}\cdot\text{m})$ in a normal plane orthogonal, because like material have like property. In the presently claimed invention, Applicant is using polyacrylonitrile (PAN) based carbon fibers (page 11, Specification) that are oxidatively activated. Mochida also teaches the use of PAN based carbon fibers that are subjected to a preliminary surface treatment such as oxidation. Additionally, a carbonized coating,

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which is carbonized from materials such as wax, pitch, natural resins, thermoplastic polymers, and thermosetting polymers, is added to the carbon fibers of the presently claimed invention. Mochida discloses impregnation of a carbon fiber assembly with a melt of mesophase pitch or mixing short carbon fibers with the mesophase pitch and that the pitch should achieve a carbonization yield of at least 80%. Therefore, the presently claimed properties would have been present (see *In re Fitzgerald* 205 USPQ 594 and *In re Best*, 195 USPQ at 433, footnote CCPA 1977).

With respect to claims 4, 7, and 8, Mochida teaches that the carbon fiber assembly to be used in the present invention is formed of various kinds of carbon fibers including PAN (column 2, lines 61-63) and the carbon fiber assembly may be a web of unidirectional fibers, a two-dimensional woven fabric or nonwoven fabric sheet. Two or more of these assemblies may be combined (column 2, lines 63-66). Additionally Mochida discloses that carbon fiber length is variable from 50 μm to 10 mm depending on the use of the final product and on the specific characteristics required (column 3, lines 7-8).

With respect to claim 6, Mochida discloses the claimed invention except that the mass fraction of the coating on the carbon fibers, based on the mass of the carbon fiber is from 0.2 to 15%. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the mass fraction of the coating on carbon fibers from 0.2 to 15%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233). In the presently

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claimed invention, Mochida discloses carbon fibers having oxidatively activated surface and a coating added to the carbon fibers wherein the coating is a carbonization product of coating material selected from the group consisting of wax, pitch, natural resins, thermoplastic polymers, and thermosetting polymers. Therefore, in absence of unexpected results selecting optimum or workable ranges of the mass fraction coating on the carbon fibers would involve routine skill in the art. Accordingly, Mochida anticipates or strongly suggests the claimed subject matter.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mochida et al. (US 5,205,888) in view of *Handbook of Carbon, Graphite, Diamond and Fullerenes – Properties, Processing and Applications* (see, Chapter 8, Table 8.6, Page 191) substantially as set forth in the 12/27/06 Office action.

The invention of Mochida is previously disclosed. Mochida is silent as to teaching of carbon fibers having a modulus of elasticity of from 200 to 250 GPa. However, *Handbook of Carbon, Graphite, Diamond and Fullerenes – Properties, Processing and Applications* discloses applications of molded graphite in production of electrodes (Chapter 5, page 110, Table 5.11). Additionally, the handbook discloses carbon fibers with modulus of elasticity of 205-235 GPa (see, Chapter 8, Table 8.6, Page 191). Thus a skilled artisan would have found it obvious to use the carbon fibers having the modulus as disclosed in the aforementioned handbook in the carbon fiber assembly of Mochida, motivated by the desire to provide sufficient strength to the carbon fiber assembly.

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6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mochida et al. (US 5,205,888) in view of Griffin et al. (US 4, 998, 709) substantially as set forth in the 12/27/06 Office Action.

The invention of Mochida is previously disclosed. Mochida is silent as to teaching of mass fraction of carbon fibers in connecting piece body is from 0.2 to 10%. However, Griffin teaches a method of making graphite electrode nipple. The graphite nipples of Griffin comprise about 8 to 20 wt% of carbon fibers (see claim 1 of Griffin). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the amount of carbon fibers as taught by Griffin in the carbon fiber assembly of Mochida, motivated by the desire to provide carbon fiber assembly with sufficient strength.

Response to Arguments

7. Applicant's arguments filed on 03/27/07 have been fully considered but they are not persuasive.

Art rejections of Mochida are maintained for the following reasons. Applicant argues that the process disclosed by Mochida does not describe the carbonization of the coating **before** adding the fibers to the green mass formed of coke and binder pitch (page 11 of 03/27/07 amendment). Applicant's arguments are not persuasive in determination of patentability because said arguments are not commensurate in scope with the claims. Claims require that "a coating added to said carbon fibers, said coating being carbonized as a carbon product of a coating material selected from the group consisting wax, pitch, natural resins...thermosetting polymers". Claims do not require

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“coating be carbonized before adding the fibers to the green mass formed of coke and binder pitch”.

Applicant argues that Mochida clearly teaches in a different direction than the invention of the instant application. To support, his/her arguments Applicant has cited column 4 lines 36-41 and column 5 lines 35-39 from the reference of Mochida. It is noted that Applicant's response is ambiguous because Applicant has not fully explained as to what is the relevance of aforementioned citations to the claim rejections. It appears that Applicant intends to convey from the aforementioned citations that Mochida discloses that pitch should not be totally carbonized hence Mochida clearly teaches in a different direction than the presently claimed invention. The Examiner respectfully disagrees. Claims do not require what percentage (if any) of coating has to be carbonized. Claims only recite, “coating being carbonized as a carbonization product of a coating material selected from the group...”. Additionally, Mochida requires that the pitch should achieve carbonization yield of at least 80% (column 3, lines 39-43). Therefore, Mochida intends to carbonize the coating.

Applicant has generally shown his/her disagreement with Examiner's comments regarding mass fraction of carbon fibers and the mass fraction of the coating on the carbon fibers, but Applicant has not provided any reasons as to why he/she disagrees. As such, Applicant's arguments are not fully responsive.

With regards to Applicant's arguments with respect to Griffin's reference, these arguments are irrelevant to the rejection because Griffin's reference is relied upon to

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teach the mass fraction of carbon fibers NOT CTE values. Accordingly, art rejections are maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

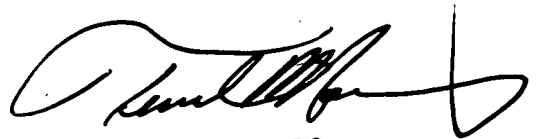
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Desai whose telephone number is 571-272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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